

IN THE  
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Martha A. Truninger et al.

Confirmation No.: Unkn.

Application No.:

Examiner:

Filing Date: Herewith

Group Art Unit: Unkn.

Title: SUBSTRATE AND METHOD OF FORMING SUBSTRATE FOR FLUID EJECTION DEVICE

Commissioner for Patents  
PO Box 1450  
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

Sir:

This Information Disclosure Statement is submitted:

- ☒ under 37 CFR 1.97(b), or  
(Within three months of filing national application; or date of entry of national application; or before mailing date of first office action on the merits; whichever occurs last)
- ☐ under 37 CFR 1.97(c) together with either a:  
☐ Statement under 37 CFR 1.97(e), or  
☐ a \$180.00 fee under 37 CFR 1.17(p), or  
(After the CFR 1.97 (b) time period, but before final action or notice of allowance, whichever occurs first)
- ☐ under 37 CFR 1.97 (d) together with a:  
☐ Statement under 37 CFR 1.97(e)(1) or (2), and  
☐ a \$180.00 fee set forth in 37 CFR 1.17(p).  
(Filed after final action, a notice of allowance, on or before payment of the issue fee)

Please charge to Deposit Account **08-2025** the sum of \$0.00 . At any time during the pendency of this application, please charge any fees required or credit any overpayment to Deposit Account **08-2025** pursuant to 37 CFR 1.25.

☒ Applicant(s) submit herewith Form PTO 1449 - Information Disclosure Citation together with copies, of patents, publications or other information of which applicant(s) are aware, which applicant(s) believe(s) may be material to the examination of this application and for which there may be a duty to disclose in accordance with 37 CFR 1.56.

☐ A concise explanation of the relevance of foreign language patents, foreign language publications and other foreign language information listed on PTO Form 1449, as presently understood by the individuals(s) designated in 37 CFR 1.56 (c) most knowledgeable about the content is given on the attached sheet, or where a foreign language patent is cited in a search report or other action by a foreign patent office in a counterpart foreign application, an English language version of the search report or action which indicates the degree of relevance found by the foreign office is listed on form PTO 1449 and is enclosed herewith.

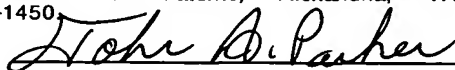
It is requested that the information disclosed herein be made of record in this application.

"Express Mail" label no. **EV310989018US**

Date of Deposit **July 15, 2003**

I hereby certify that this is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to: Commissioner for Patents, Alexandria, VA 22313-1450.

By



Typed Name: **John A. Park**

Respectfully submitted,

**Martha A. Truninger et al.**

By



**Scott A. Lund**

Attorney/Agent for Applicant(s)

Reg. No. **41,166**

Date: **July 15, 2003**

<b>FORM PTO-1449</b>  <b>LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT</b>  (Use several sheets if necessary)	ATTY. DOCKET NO.	APPLICATION NO.	CONFIRMATION NO.
	<b>200210175-1</b>		
	APPLICANT <b>Martha A. Truning r et al.</b>		
	FILING DATE	GROUP	
	<b>Herewith</b>	<b>Unkn.</b>	

## REFERENCE DESIGNATION

## U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	PUBLICATION DATE	NAME	Pages, Columns, Lines Where Relevant Passages or Figures Appear
	2A	6,008,138	12/1999	Laermer et al.	
	2B	6,045,710	04/2000	Silverbrook	
	2C	6,081,635	06/2000	Hehmann	
	2D	6,096,656	08/2000	Matzke et al.	
	2E	6,139,761	10/2000	Ohkuma	
	2F	6,305,080	10/2001	Komuro et al.	
	2G	5,124,717	06/1992	Campanelli et al.	
	2H	5,141,596	08/1992	Hawkins et al.	
	2I	6,481,832	11/19/2002	Liu et al.	
	2J				
	2K				

## FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	PUBLICATION DATE	NAME OF PATENTEE OR APPLICANT	Pages/Columns/Lines Where Relevant Passages/Figures Appear	Check if Translation attached
	2L	DE19538103A1	04/1997	Bosch GMBH		
	2M	GB2245366A	01/1992	Bosch GMBH		
	2N	GB 2290413A	12/1995	Bosch GMBH		
	2O	GB 2341348A	03/2000	Bosch GMBH		
	2P					

## OTHER REFERENCES (including Author, Title, Date, Pertinent Pages, etc.)

	2Q	"Anisotropic Silicon Etch Characterization in the TFTL STS Etcher"; August 20, 1999; pp: 1-5.
	2R	"Etching Characteristics And Profile Control in a Time Multiplexed Inductively Coupled Plasma Etcher"; by: AA Ayon, CC Lin, RA Braff & MA Schmidt of the Department of Electrical Engineering and Computer Science (EECS); Solid-State Sensor and Actuator Workshop, Hilton Head Island, SC; June 8-11, 1998; pp: 41-44.
	2S	"Characterization of a Time Multiplexed Inductively Coupled Plasma Etcher"; by: AA Ayon, R Braff, CC Lin, HH Sawin & MA Schmidt; Journal of the Electrochemical Society; 146 (1); 1999; pp: 339-349.

EXAMINER

DATE CONSIDERED

**PATENT APPLICATION**

Sheet 1 of 5

<b>FORM PTO-1449</b>  <b>LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT</b>  (Use several sheets if necessary)	ATTY. DOCKET NO. <b>200210175-1</b>	APPLICATION NO.	CONFIRMATION NO.
	APPLICANT <b>Martha A. Truninger t al.</b>		
	FILING DATE <b>Herewith</b>	GROUP <b>Unkn.</b>	

**REFERENCE DESIGNATION U.S. PATENT DOCUMENTS**

EXAMINER INITIAL		DOCUMENT NUMBER	PUBLICATION DATE	NAME	Pages, Columns, Lines Where Relevant Passages or Figures Appear
	1A	5,385,635	01/1995	O'Neill	
	1B	5,387,314	02/1995	Baughman et al.	
	1C	5,393,711	02/1995	Biallas et al.	
	1D	5,441,593	08/1995	Baughman et al.	
	1E	5,498,312	03/1996	Laermer et al.	
	1F	5,501,893	03/1996	Laermer et al.	
	1G	5,526,454	06/1996	Mayer	
	1H	5,541,140	07/1998	Goebel et al.	
	1I	5,716,533	02/1998	O'Neill et al.	
	1J	5,756,901	05/1998	Kurle et al.	
	1K	5,870,123	02/1999	Lorenze, Jr. et al.	

**FOREIGN PATENT DOCUMENTS**

		DOCUMENT NUMBER	PUBLICATION DATE	NAME OF PATENTEE OR APPLICANT	Pages/Columns/Lines Where Relevant Passages/Figures Appear	Check if Translation attached
	1L	WO 9837577	08/1998	Bosch GMBH		
	1M	WO 0023376	04/2000	Bosch GMBH		
	1N	EP 0865151A2	09/1998	Hewlett-Packard Co.		
	1O	EP 0886307A2	12/1998	Canon Kabushiki		
	1P	EP 0978832A2	02/2000	Hewlett-Packard Co.		

**OTHER REFERENCES (including Author, Title, Date, Pertinent Pages, etc.)**

	1Q	"Cryogenic Etching of Deep Narrow Trenches In Silicon"; by: Aachboun et al.; Journal Of Vacuum Science & Technology A; Vol. 18, No. 4; pt. 1-2; July-Aug. 2000; Abstract Only.
	1R	"An Array of Hollow Microcapillaries For The Controlled Injection of Genetic Materials Into Animal/Plant Cells"; by: K. Chun et al.; Proceedings of 12th International Workshop on Micro Electro Mechanical Systems (MEMS); Jan. 1999; Abstract Only.
	1S	"Deep Etching Key to the MEMS/MST Revolution"; by: Prashant Gadil; R & D; July 1998; p. 38.

EXAMINER

DATE CONSIDERED

<b>FORM PTO-1449</b>  <b>LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT</b>  (Use several sheets if necessary)	ATTY. DOCKET NO. <b>200210175-1</b>	APPLICATION NO.	CONFIRMATION NO.
	APPLICANT <b>Martha A. Truninger et al.</b>		
	FILING DATE <b>Herewith</b>	GROUP <b>Unkn.</b>	

## REFERENCE DESIGNATION

## U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	PUBLICATION DATE	NAME	Pages, Columns, Lines Where Relevant Passages or Figures Appear
	3A				
	3B				
	3C				
	3D				
	3E				
	3F				
	3G				
	3H				
	3I				
	3J				
	3K				

## FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	PUBLICATION DATE	NAME OF PATENTEE OR APPLICANT	Pages/Columns/Lines Where Relevant Passages/Figures Appear	Check if Translation attached
	3L					
	3M					
	3N					
	3O					
	3P					

## OTHER REFERENCES (including Author, Title, Date, Pertinent Pages, etc.)

3Q	STS-Surface Technology Systems-1st ASE Users Meeting, pp. 1-10; Advanced Silicon Etch, pp. 1-28; Technology Review, pp. 1-10; California, 1997.
3R	"High-Aspect-Ratio Si Etching for Microsensor Fabrication"; by: WH Juan & SW Pang; Journal of Vacuum Science & Technology A; Vol. 13, No. 3; 1995; pp: 834-838.
3S	"Bosch Deep Silicon Etching: Improved Uniformity and Etch Rate for Advanced MEMS Applications"; by: F Laermer et al.; 0-7803-5194-00; 1999; pp. 211-216.

EXAMINER

DATE CONSIDERED

<b>FORM PTO-1449</b>  <b>LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT</b>  (Use several sheets if necessary)	ATTY. DOCKET NO. <b>200210175-1</b>	APPLICATION NO.	CONFIRMATION NO.
	APPLICANT <b>Martha A. Truninger et al.</b>		
	FILING DATE <b>Herewith</b>	GROUP <b>Unkn.</b>	

REFERENCE DESIGNATION	U.S. PATENT DOCUMENTS
-----------------------	-----------------------

EXAMINER INITIAL		DOCUMENT NUMBER	PUBLICATION DATE	NAME	Pages, Columns, Lines Where Relevant Passages or Figures Appear
	4A				
	4B				
	4C				
	4D				
	4E				
	4F				
	4G				
	4H				
	4I				
	4J				
	4K				

FOREIGN PATENT DOCUMENTS
--------------------------

		DOCUMENT NUMBER	PUBLICATION DATE	NAME OF PATENTEE OR APPLICANT	Pages/Columns/Lines Where Relevant Passages/Figures Appear	Check if Translation attached
	4L					
	4M					
	4N					
	4O					
	4P					

OTHER REFERENCES (including Author, Title, Date, Pertinent Pages, etc.)
---

4Q	"Advanced Silicon Etching Using High Density Plasmas"; by: JK Bhardwaj & H Ashraf; SPIE-Society of Photo-Optical Instrumentation Engineers; Vol. 2639; October 1995; pp 224-233.
4R	"Recent Advances in Silicon Etching for MEMS Using the ASE Process"; by: AM Hynes et al.; Sensors And Actuators; Vol. 74; 1999; pp 13-17.
4S	"Fabrication of Thick Silicon Dioxide Layers Using DRIE, Oxidation and Trench Refill"; by: C Zhang & K Najafi; Proceedings of 15th IEEE International Conference on Micro Electro Mechanical Systems; Jan. 20-24, 2002; pp. 160-163.

EXAMINER

DATE CONSIDERED

**PATENT APPLICATION**

Sheet 5 of 5

<b>FORM PTO-1449</b>  <b>LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT</b>  (Use several sheets if necessary)	ATTY. DOCKET NO. <b>200210175-1</b>	APPLICATION NO.	CONFIRMATION NO.
APPLICANT <b>Martha A. Truninger t al.</b>			
FILING DATE <b>H r with</b>		GROUP <b>Unkn.</b>	

**REFERENCE DESIGNATION                      U.S. PATENT DOCUMENTS**

EXAMINER INITIAL		DOCUMENT NUMBER	PUBLICATION DATE	NAME	Pages, Columns, Lines Where Relevant Passages or Figures Appear
	5A				
	5B				
	5C				
	5D				
	5E				
	5F				
	5G				
	5H				
	5I				
	5J				
	5K				

**FOREIGN PATENT DOCUMENTS**

		DOCUMENT NUMBER	PUBLICATION DATE	NAME OF PATENTEE OR APPLICANT	Pages/Columns/Lines Where Relevant Passages/Figures Appear	Check if Translation attached
	5L					
	5M					
	5N					
	5O					
	5P					

**OTHER REFERENCES (including Author, Title, Date, Pertinent Pages, etc.)**

	5Q	"Fabrication of Out-of-Plane Curved Surfaces in SI by Utilizing RIE Lag"; by: TA Chou & K Najafi; Proceedings of 15th IEEE International Conference on Micro Electro Mechanical Systems; Jan. 20-24, 2002; pp. 145-148.
	5R	
	5S	

EXAMINER

DATE CONSIDERED